


In this given, limited time I will take you on a short ride to explore Sudan's experience in implementing solar systems or generators. We will cover:

1. Why and where to use Solar systems
2. Types of systems
3. Economics
4. Smart Solution
5. Success Story/funny stories
6. Recommendations
7. Lessons Learned
8. The Message



Why & Where



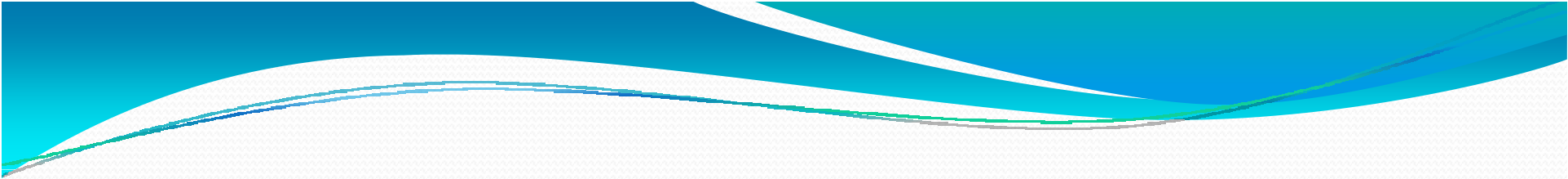
Sudan is a large country of area 1,886,068 km² (became no. 2 in Africa) , of relatively low population , around 80% of the villages are scattered and of very low population , sometimes less than 200 person , they do not like to leave their land and gather in bigger villages or towns . Therefore transport of electricity from the grid is not feasible. Fuel prices keep escalating that use of diesel generators is not economical. some places it is very difficult to reach in the rain season , almost isolated for four month. Most ,of such , villages are in Darfur & Kurdofoan then eastern part of Sudan and relatively less in North and South Sudan (hydropower grids)

War in Darfur limited the spread use of renewable energy systems in Darfur rural areas.

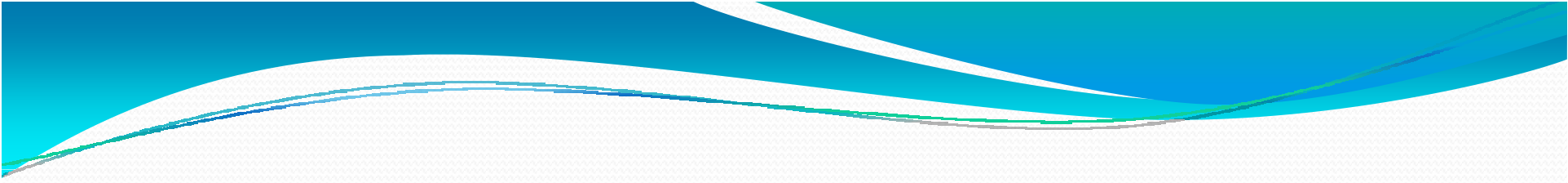
see map please.

Map of Sudan





TYPE OF SYSTEMS:



Due to the uniqueness of Sudan which of scattered population and villages, most of the renewable energy systems are stand alone and low power DC systems

Implemented systems are:



-simple lighting system of 3 to 5 small DC. Lamps , TV for houses , schools. mosques and Khalawi of power less than 500 W. This is the main use in villages (around 70 % in terms of number of systems)

-Street light for main roads

-clubs, to facilitate TV and light to villagers and study room for students

**-Fridges for Vaccination , as. A matter of fact Sudan is unique to impose a rule that
ALL VACCINATION FRIDGES HAVE TO BE POWERED BY
PV GENERATORS**

-Water pumping for drinking, irrigation and shelter belts to reduce desertification.

-Some systems use inverters , which one of the things reduce systems reliability and sustainability , but was not possible to avoid it

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ECONOMICS



In villages and absence of national grid , small solar systems are of faster payback

period and higher present worth values compared to conventional power systems

Lighting system of short pay back period. Most of it of less than ONE year.

Vaccination fridges less than 6 month

Water pumping from 3 to 5 years

However we did not count systems sustainability and reliability, in which solar Systems are superior in terms of low maintenance cost and long meantime failure.



SMART SOLUTIONS:



Two smart solutions were
of international interest:



Solution 1

PV for child education, it is laptop based solution powered by PV generator. The laptop is having software for self learning. A simple server and wifi internet network to monitor and support the children. this is counted by one of UN organization as innovative method to provide education for children has no chance to have or to go to school or can not have or reach schools out side their village

(please watch the Video at the end)




Solution 2

Saving lives in deserts: This is my solution which is credited by ISES, Simply it is to provide masts or high pole of lamp send intermittent signals or flashing to guide people who lost their way in the desert. The solution includes nomads settlement to ensure system sustainability



SUCCESS STORIES

Khalawi Darfur

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- We convinced a governor to try a sample of 3 small Dc lighting systems, each system is 3 florescent I 20 W lamps. He used them to give light for 3 Khalawies. He was so happy with the sample that he decided to purchase 50 systems!! We advised him to have FIVE HUNDRED systems and pay nothing! By converting it to a national project to support Khalawies in Darfur. Lighting Khalawi Darfur by solar systems inaugurated! Most of the banks, businessmen, and NGOs sent their donations. The received was enough to implement around 200 Khalwa

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FUNNY STORIES

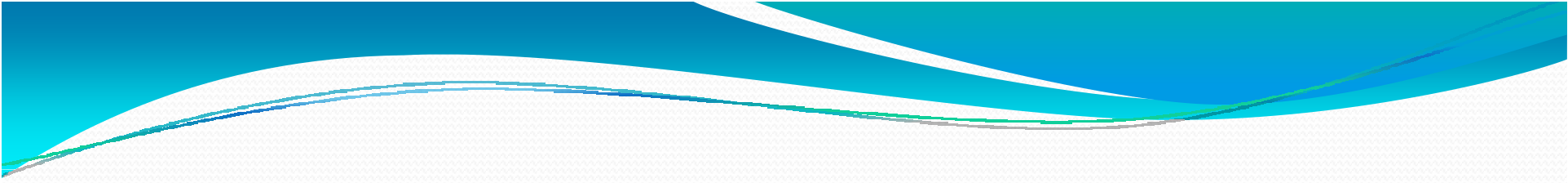


Funny Stories

- The madman: in Bara town, central west of Sudan, a mad man broke the PVX panels of a solar pumps because he couldn't believe the pump running silently, he believed the panels is a magic work!!!
- Women of Gha'a




RECOMMENDATIONS

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- Our regional organizations to cater for that, e.g.: help in awareness, training, microfinance, or revolving funds
 - Government exempt solar systems & centralized systems promptly from customs and taxes



LESSONS LEARNED:

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- Free system of less sustainability, villages or communities has to pay at least the maintenance cost to up-keep the system running
 - Villagers are accepting the technology smoothly, specially small PV systems, market is developed and is growing
 - Projects which got finance/revolving funds of higher sustainability and were of more success
 - Small, stand alone decentralized systems are the most suitable one for rural areas.



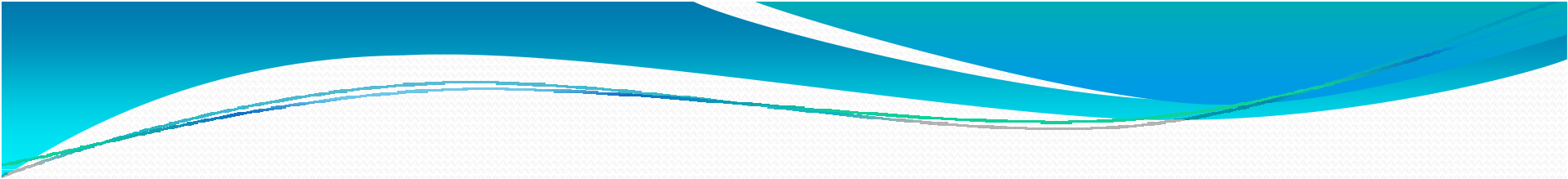
Last but not least;

always remember to:



KISS

Keep It Simple & Safe



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